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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,632	05/09/2006	Rohit Garg	US030481US	1427

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EXAMINER	
REARDON, ROCHELLE D	
ART UNIT	**PAPER NUMBER**
4185	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,632	GARG ET AL.	
	Examiner	Art Unit	
	ROCHELLE REARDON	4185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/09/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1 and 10** is rejected under 35 U.S.C. 102(b) as being anticipated by **Schwartz (US 5,720,291)**.

Regarding claim 1, Schwartz discloses rendering an image which utilizes separate three dimensional rendering parameters for the tissue and flow information (abstract, lines 8-10). The images of the sequence are displayed in rapid succession on a display (column 3, lines 62-65). A set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time proximity to maintain spatial correspondence of the data sets (column 2, lines 12-14). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity (column 3, lines 43-49).

Regarding claim 10, Schwartz discloses rendering an image which utilizes separate three dimensional rendering parameters for the tissue and flow information (abstract, lines 8-10). The images of the sequence are displayed in rapid succession on a display (column 3, lines 62-65). A set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time proximity to

maintain spatial correspondence of the data sets (column 2, lines 12-14). A three dimensional image processor for processing Doppler display information is incorporated (claim 17). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity (column 3, lines 43-49). The user may enter values for the opacity and contrast to be imparted to each type of image information (column 4, lines 58-60).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 2-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Schwartz (US 5,720,291)** in view of **Pedrizzetti et al. (US PG Pub 2004/0254440)**.

Regarding claims 2, 3 and 4, Schwartz discloses acquiring a set of three dimensional ultrasonic tissue data and a set of three dimensional ultrasonic blood flow data from a region of the body (column 2, lines 12-14). In addition, rendering utilizes three dimensional parameters for flow information (abstract, lines 8-10). The display technique may also display color flow which represents different characteristics of the blood flow by different colors and brightness (column 6, lines 32-34). Schwartz fails to disclose acquiring a parametric image of a characteristic of blood flow of the region in the body.

However, Pedrizzetti teaches creating a parametric image in order to carry out visual analysis (paragraph 44, lines 3-5). This allows evaluation of perfusion properties of the different tissue regions. Perfusion is made by introducing a contrast agent in a view, which moves with the blood (paragraph 3, lines 8-11).

6. Given the teachings of Pedrizzetti, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging display system of Schwartz with the ability to acquire a parametric image of a characteristic of blood flow.

Doing so would provide the ability to view both the blow flow with respect to a region in the body, as well as characteristics of the blow flow, without impairing visualization of the image as a whole.

Regarding claim 5, Schwartz fails to disclose varying the relative opacity in a continuous manner.

However, Schwartz discloses a control for varying the display opacity of the blood flow (column 3, lines 44-49). In addition the user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61).

7. Given the teachings of Schwartz, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging display system with the ability to vary the opacity in a continuous manner.

Doing so would provide the ability to vary the opacity and contrast between the data sets in an constant manner.

Regarding claim 6, Schwartz fails to disclose varying the relative opacity in a stepwise manner.

However, Schwartz discloses a control for varying the display opacity of the blood flow (column 3, lines 44-49). In addition the user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61).

8. Given the teachings of Schwartz, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging display system with the ability to vary the opacity in a continuous manner.

Doing so would provide the ability to vary the opacity and contrast between the data sets in a phased manner in order to optimize image viewing.

Regarding claims 7-9, Schwartz discloses controlling the transparency or opacity of two types of image information by means of a blood flow and tissue opacity control (column 3, lines 44-47). The tissue image information may be displayed with greater transparency than the blood flow information, or with greater or lesser contrast (column 4, lines 63-65).

Regarding claims 11 and 12, Schwartz discloses acquiring a set of three dimensional ultrasonic tissue data and a set of three dimensional ultrasonic blood flow data from a region of the body (column 2, lines 12-14). In addition, rendering utilizes three dimensional parameters for flow information (abstract, lines 8-10). The display technique may also display color flow which represents different characteristics of the blood flow by different colors and brightness (column 6, lines 32-34). Schwartz fails to disclose acquiring a parametric image of a characteristic of blood flow of the region in the body.

However, Pedrizzetti teaches creating a parametric image in order to carry out visual analysis (paragraph 44, lines 3-5). This allows evaluation of perfusion properties of the different tissue regions. Perfusion is made by introducing a contrast agent in a view, which moves with the blood (paragraph 3, lines 8-11).

9. Given the teachings of Pedrizzetti, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging display system of Schwartz with the ability to acquire a parametric image of a characteristic of blood flow.

Doing so would provide the ability to view both the blow flow with respect to a region in the body, as well as characteristics of the blow flow, without impairing visualization of the image as a whole.

Regarding claim 13, Schwartz discloses images of the sequence that are displayed in rapid succession on a display (column 3, lines 62-65). A set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time proximity to maintain spatial correspondence of the data sets (column 2, lines 12-14). A three dimensional image processor for processing Doppler display information is incorporated (claim 17). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity (column 3, lines 43-49). Schwartz fails to disclose a opacity processor to set the relative opacity within a varying range.

However, Schwartz teaches the user ability to enter values for the opacity and contrast to be imparted to each type of image information (column 4, lines 58-60).

10. Given the teachings of Schwartz, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the image display system having the ability for user input values in order to vary the opacity of both data types, with an opacity processor.

Doing so would provide the ability to make automatic the change in opacity of the data types in order to enhance the data contrast.

Regarding claim 14, Schwartz discloses a set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time proximity to maintain spatial correspondence of the data sets (column 2, lines 12-14). A three dimensional image processor for processing Doppler display information is incorporated (claim 17). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity (column 3, lines 43-49). The user may enter values for the opacity and contrast to be imparted to each type of image information (column 4, lines 58-60). The user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61). Schwartz fails to disclose varying the relative opacity in a continuous manner.

However, Schwartz discloses a control for varying the display opacity of the blood flow (column 3, lines 44-49). In addition the user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61).

11. Given the teachings of Schwartz, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging display system with the ability to vary the opacity in a continuous manner.

Doing so would provide the ability to vary the opacity and contrast between the data sets in an constant manner.

Regarding claim 15, Schwartz discloses a set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time

proximity to maintain spatial correspondence of the data sets (column 2, lines 12-14). A three dimensional image processor for processing Doppler display information is incorporated (claim 17). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity (column 3, lines 43-49). The user may enter values for the opacity and contrast to be imparted to each type of image information (column 4, lines 58-60). The user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61). Schwartz fails to disclose varying the relative opacity in a continuous manner.

Regarding claim 16, Schwartz discloses a set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time proximity to maintain spatial correspondence of the data sets (column 2, lines 12-14). A three dimensional image processor for processing Doppler display information is incorporated (claim 17). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity (column 3, lines 43-49). The user may enter values for the opacity and contrast to be imparted to each type of image information (column 4, lines 58-60). The user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61). The display of the images of the sequence may be displayed in rapid succession so that the internal structure appears to rotate (column 3, lines 62-65).

In addition, the three dimensional presentations can be formed in which the tissue is depicted as a semi-transparent or sparsely complete body to see through to the internal structure and vasculature (column 3, lines 29-32). Schwartz fails to disclose varying the relative opacity in a stepwise manner.

However, Schwartz discloses a control for varying the display opacity of the blood flow (column 3, lines 44-49). In addition the user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61).

12. Given the teachings of Schwartz, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging display system with the ability to vary the opacity in a continuous manner.

Doing so would provide the ability to vary the opacity and contrast between the data sets in a phased manner in order to optimize image viewing.

Regarding claim 17, The images are displayed in rapid succession, and the view can visualize the three dimensional display of an organ and their internal structures as they appear to rotate in front of the viewer (column 3, lines 62-65).

Regarding claims 18 and 19, Schwartz discloses a set of ultrasonic tissue data and ultrasonic blood flow data are acquired from a common region of the body in close time proximity to maintain spatial correspondence of the data sets (column 2, lines 12-14). A three dimensional image processor for processing Doppler display information is incorporated (claim 17). An image frame may be rendered by controlling the transparency of the two types of image information by means of a blood flow and tissue opacity control. The controls are capable of separately controlling the display opacity,

as there is both a blood flow opacity control and a tissue opacity control (column 3, lines 43-49). The user may enter values for the opacity and contrast to be imparted to each type of image information (column 4, lines 58-60). The user may enter values for opacity and contrast to be imparted on each type of image information (column 4, lines 58-61).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROCHELLE REARDON whose telephone number is (571)270-7104. The examiner can normally be reached on Monday thru Friday, 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell McKinnon can be reached on (571)272-4797. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROCHELLE REARDON/
Examiner, Art Unit 4185

/Len Tran/

Supervisory Patent Examiner, Art Unit 3752